Repurposing Old Files as Turning Tools

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Reusing worn files as turning tools is a controversial topic.

Bobby has been reusing old files as turning tools for his whole woodworking career, without incident, so he maintains that this is safe to do. Bobby only uses large, thick files to ensure that they are strong enough. He grinds down the teeth and grinds a profile on the cutting end. A proper wooden handle is fitted to make the file fit for its new purpose.

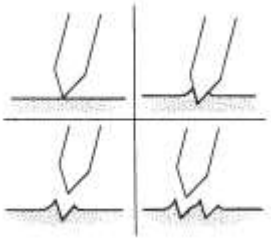
In support of his position, Bobby provided some references, one of which is reproduced here for your information. The other two discuss how to grind the files, but not the merits of doing so.

- How-to article posted on the Fine Woodworking web site: http://www.finewoodworking.com/2013/06/03/turning-tools-on-the-cheap - it is also instructive to read the comments at the end of the article, where the risks are discussed.

This has always been a controversial subject, leading to some lively discussion. Here is some additional back-ground for your information:

Why do people reuse files? Essentially a hand-file is a length of high-carbon steel with cutting teeth impressed on it. Once the teeth are worn, the file is useless for its original purpose, so it is only natural to seek another use for it. There are tricks to refresh a file by dipping it in acid, which etches the teeth, to extend its life, but eventually it will become blunt again.

One popular reuse of old files is for turning tools, particularly scrapers.



How is a file made? File steel is typically 1.0 to 1.25% carbon steel, chosen for its hardenability. Hardness at the tooth tip and toughness of the overall tooth are prized for a longer working life. The blank is forged to the required shape and then annealed so that the tooth pattern can be cut. In the past the tooth pattern was cut by hand, particularly for rasps. Nowadays, it is mostly done by machine.

(Picture from the Nicholson Guide to Filing)

The blank is then carefully reheated and quenched to achieve the optimum balance of hardness and toughness. The tang is annealed so that it is not brittle, otherwise it would be a weak point. Distortion in the body must be controlled to ensure the file remains straight.

[Using info from https://en.wikipedia.org/wiki/File_(tool)]

Here are some more sources that you may wish to consult:

From http://www.woodcentral.com/russ/russ10.shtml

OTHER SOURCES OF STEEL

Old Files

They are a readily available source of hardened steel, there have been a lot of articles published that describe using them, and every gathering of woodturners has at least one "expert" on the subject. This doesn't make them a safe woodturning tool, and I am an advocate of NOT using an old file for making a cutting tool. Yes, we can anneal, harden, and temper them just as we would another piece of high carbon steel. But, the difference is that every groove in the surface of the file is a stress concentration where a crack into the steel is waiting to start. Many of these files may already have hairline cracks that have started to migrate into the steel. We can grind the surfaces, and we can do all sorts of heat treatment to temper the steel to a useable hardness, but it is

impossible to remove a hairline crack. We cannot see them, and it only takes one (1) to make it a dangerous tool.

This is from a Health and Safety manual of training workshop:
https://www.midaslab.ca/wp-content/uploads/2016/09/MIDAS-Safety-Manual-for-Waiver.pdf

Files
Selection of the right kind of file for the job will prevent injuries and lengthen the life of the file. The extremely hard and brittle steel of the file chips easily, the file should never be cleaned by being struck against a vise or other metal object. A file-cleaning card or brush should be used.
For the same reason, a file is not to be hammered or used as a pry. Such abuse frequently results in the file's chipping or breaking causing injury to the user. A file should not be made into a center punch, chisel, or any other type of tool because the hardened steel may fracture in use.

A file is never to be used without a smooth, crack-free handle; if the file should bind, the tang may puncture the palm of the hand, the wrist, or other part of the body. Under some conditions, a clamp-on raised offset handle may be useful to give extra clearance for the hands. Files are not to be used on lathe stock turning at high speed (faster than 3 turns per file stroke) because the end of the file may strike the chuck, dog, or face plate and throw the file (or metal chip) back at the operator hard enough to inflict serious injury.

See also http://www.ukworkshop.co.uk/forums/wt-tools-from-old-files-t67331.html for another discussion on the merits of reusing files.

Frank Pain, author of The Practical Wood Turner, has this to say about using files (Page 58, 1965 edition, published by Bell & Hyman):

> **"Scraping tools.** We will now consider scraping tools made out of files, and let me say at once we use them as they are without altering the temper, for all thick files are softer inside and are ideal. They are not liable to snap off if you use thick ones. The bevel is not important but it is certainly not acute – in fact it could be nearly square across. **…"**

Frank then goes on to describe various grinds and shapes for scrapers. The important point is the use of **thick** files. In the manufacturing process, these are not through-hardened, retaining toughness in the centre. Thin files are more likely to be through-hardened, and liable to snap. This has been my personal experience, with a small file snapping while hand-filing.

Health and Safety.

> Woodturning does have risks attached to it, but with the right precautions the risks can be avoided. Any woodturning tool can fracture in use, particularly if you have a "catch". WWA members can relate experiences with reputable HSS tools breaking, so all tools can break. You must wear eye protection, using proper impact rated safety glasses. A full-face visor will provide additional protection, as safety glasses do not provide full facial coverage against heavy impacts.

To summarise the discussion above, it seems that many people have reused files, and only a few have reported failures. Using **thick**, well-made files that have been reground ***as scrapers*** seems to be relatively low risk – remember that a scraper is used nose-down! Using a scraper with the point upwards, riding the bevel on the work is inviting a catch, and doing so with an old file is **high risk** – in the event of a catch, the tool is much more likely to fracture.